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Generalization of the Brunn–Minkowski inequality in the form of Hadwiger for power moments

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Abstract

© 2016, Pleiades Publishing, Ltd.A class of functionals on a domain in Euclidean space is constructed and a Brunn–Minkowski-type inequality for this class is proved. The construction of the functionals on the domain uses a point of minimum of a function of many variables related to these functionals; proving the existence of this function is an essential point of the study. Special cases of functionals for which the point of minimum can be found explicitly are considered. The obtained Brunn–Minkowski inequality generalizes the corresponding inequality for moments with respect to the center of mass and hyperplanes proved by Hadwiger to the case of power moments. It is worth mentioning that the point of minimum of the functional does not generally coincide with the center of mass; the coincidence occurs only in special cases, which is confirmed by particular examples.

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Keywords

Brunn–Minkowski inequality, concave functional, convex domain, Pre´ kopa–Leindler inequality